

REMARKS

Initially, Applicants would like to express appreciation to the Examiner for the detailed Final Official Action provided.

However, Applicants note that the Examiner has not acknowledged Applicants' Claim for Priority and receipt of the certified copy of the priority document. It is noted that the Patent Application Information Retrieval (PAIR) system on the U.S. Patent and Trademark Office website reflects Applicants' Claim for Priority in the instant application. Accordingly, the Examiner is requested to acknowledge receipt of Applicants' Claim for Priority and receipt of the certified copy of the priority document in the next Official Action.

Claims 1-4 are currently pending. Applicants respectfully request reconsideration of the outstanding rejection and allowance of claims 1-4 in the present application. Such action is respectfully requested and is now believed to be appropriate and proper.

The Examiner has rejected claims 1-4 under 35 U.S.C. § 103(a) as being unpatentable over INOUE et al. (U.S. Patent Appl. Pub. No. 2003/0157404) in view of KAGEYAMA (U.S. Patent Appl. Pub. No. 2001/0006746) and ENDO (JP 2001-155698).

However, Applicants note that INOUE et al., KAGEYAMA, and ENDO fail to teach or suggest the subject matter claimed in claim 1. In particular, claim 1 sets forth a generally oval battery including, inter alia, "a battery case having a generally oval cross section, a generally oval sealing plate including a pair of linear parts opposite each other and a pair of circular parts opposite each other forming a generally oval shape and forming locations where the linear parts join the circular parts and the shape of the sealing plate changes from a circular part to a linear part and from a linear part to a circular part, and an electrode plate assembly, said sealing plate having a U-shaped

cross section, and said battery having a thickness of 4mm or more and an aspect ratio of 3 or more, wherein the locations where the shape of the battery case changes from a circular part to a linear part or from a linear part to a circular part in an interface between said battery case and the sealing plate acts as a point where breakage occurs for discharge of gas”.

The present invention provides an explosion preventing battery including a discharge mechanism in which the weld between the sealing plate 3 and the battery case 2 selectively breaks at a location where the shape of the battery case changes from the linear part 4 to the circular part 5 or from the circular part 5 to the linear part 4. In the present invention, selective breakage at the particular location where the shape of the battery case changes from a linear part to a circular part or from a circular part to a linear part controls gas discharge and prevents explosion. Further, the present invention includes four breakage points. Thus, the battery includes a breakage point at *each* of the four locations where the shape of the battery case changes from a linear part to a circular part and from a circular part to a linear part.

In the present invention, the weld between the battery case 2 and the sealing plate 3 is made to break at a location where the shape of the battery case changes from the circular part to the linear part or from the linear part to the circular part, as shown in figure 3. *Due to the differences in the deformation of the circular part and the linear part, the weld will break at a location where the shape of the battery case changes from the circular part to the linear part or from the linear part to the circular part.* Accordingly, Applicants’ claimed invention provides a battery which easily discharges gas and prevents explosion in a controlled and predictable manner, without requiring expensive manufacturing equipment or many processing steps, and breakage of the weld is

predictable and controllable, thus improving the performance of the battery and improving the explosion prevention feature of Applicants' invention.

The INOUE et al. publication teaches a battery having a generally oval sealing plate. As recognized by the Examiner, INOUE et al. fails to teach or suggest a breaking point at a location where the shape of the battery case changes from the circular part to the linear part or from the linear part to the circular part in an interface between the battery case and the sealing plate. INOUE et al. also fails to teach or suggest a battery having a thickness of 4mm or more and an aspect ratio of 3 or more.

The KAGEYAMA publication teaches a flat, rectangular battery, but fails to teach or suggest a breaking point at a location where the shape of the battery case changes from a circular part to a linear part or from a linear part to a circular part in an interface between the battery case and the sealing plate.

The ENDO publication is directed to a rectangular battery. As shown in the figures, the ENDO battery includes a sealing plate 2 that is rectangular. Each of the four corners of the rectangular sealing plate is gently curved between the respective long sides and shorter sides. As shown in the figures, the long sides and shorter sides of the rectangular sealing plate are linear portions. Since the corners are gently curved and the sides of the rectangle are linear, the sealing plate includes locations at which the shape of the sealing plate changes from a curved (or substantially circular) part to a linear part and from a linear part to a circular part. As shown particularly in figures 1 and 4, these locations of changing from a circular part to a linear part and from a linear part to a circular part are positioned at the meeting points of the corners and the sides. These locations are positioned precisely at the corners. For reference, see figure 4, the line A-A,

which is positioned on an entirely linear portion. The locations of changing from a circular part to a linear part and from a linear part to a circular part are positioned closer to the corner than the line A-A. Any position along the long side of the sealing plate is an entirely linear portion. It is respectfully submitted that any other location is not the location of changing from a circular part to a linear part and from a linear part to a circular part. At any location further from the corner than the line A-A, the shape has *already* changed to a linear portion.

The Examiner indicates that reference numeral 5 in figure 4 indicates a location where the shape of the battery case changes from a circular part to a linear part or from a linear part to a circular part, that acts as a breakage point. However, Applicants respectfully submit that figure 4 clearly shows the indicated breakage point 5 completely on a linear portion of the sealing plate. In this regard, even the line A-A is completely on a linear portion of the sealing plate. It cannot fairly be said that the point 5 is positioned at the location where the shape case changes from a circular part to a linear part or from a linear part to a circular part. Clearly, at the location of breakage point 5, the shape of the sealing plate is entirely linear.

Additionally, the Examiner has indicated that “figure 3 number 7 of applicant’s drawings show that the breakage point is also on the linear portion of the sealing plate”. However, Applicants respectfully submit that the Examiner has misread the specification and drawings of the instant invention. In this regard, figures 3 and 7 clearly show that the breakage point 7 is located where the shape of the sealing plate changes from a linear part to a circular part and from a circular part to a linear part. Further, figure 7 shows the radius R of the circular portion, and the breakage point at the point where the shape of the sealing plate changes from a linear part to a circular part and from a circular part to a linear part.

Additionally, the ENDO device includes a single breakage point 5. In contradistinction, the present invention includes four breakage points, one at each point where the shape of the sealing plate changes from a linear part to a circular part and from a circular part to a linear part. In the present invention, the weld between the battery case 2 and the sealing plate 3 is made to break at a location where the shape of the battery case changes from the circular part to the linear part or from the linear part to the circular part, as shown in figure 3. *Due to the differences in the deformation of the circular part and the linear part, the weld will break at a location where the shape of the battery case changes from the circular part to the linear part or from the linear part to the circular part.* Not only does the ENDO device fail to show a breakage point at a point where the shape of the sealing plate changes from a linear part to a circular part or from a circular part to a linear part, but the ENDO device also fails to show “wherein the locations where the shape of the battery case changes from a circular part to a linear part or from a linear part to a circular part in an interface between said battery case and the sealing plate acts as a point where breakage occurs for discharge of gas”. In other words, in the present invention, each of the points where the shape changes comprises a breakage point. However, the ENDO device includes only a breakage point that is put at a location on a linear portion. The ENDO device does not include a device in which all of the shape changing locations acting as breakage points.

Therefore, the ENDO publication fails to cure the deficiencies of the INOUE et al. and KAGEYAMA devices, and even assuming, arguendo, that the teachings of INOUE et al., KAGEYAMA, and ENDO have been properly combined, Applicants’ claimed generally oval battery including, inter alia, “a battery case having a generally oval cross section, a generally oval sealing plate including a pair of linear parts opposite each other and a pair of circular parts opposite

each other forming a generally oval shape and forming locations where the linear parts join the circular parts and the shape of the sealing plate changes from a circular part to a linear part and from a linear part to a circular part, and an electrode plate assembly, said sealing plate having a U-shaped cross section, and said battery having a thickness of 4mm or more and an aspect ratio of 3 or more, wherein the locations where the shape of the battery case changes from a circular part to a linear part or from a linear part to a circular part in an interface between said battery case and the sealing plate acts as a point where breakage occurs for discharge of gas” as set forth in claim 1 would not have resulted from the combined teachings thereof.

Moreover, there is nothing in the cited prior art that would lead one of ordinary skill in the art to make the modification suggested by the Examiner in the rejection of claim 1 under 35 U.S.C. § 103(a) over INOUE et al. in view of KAGEYAMA and ENDO. Thus, the only reason to combine the teachings of INOUE et al., KAGEYAMA and ENDO results from a review of Applicants’ disclosure and the application of impermissible hindsight.

Accordingly, the rejection of claim 1 under 35 U.S.C. § 103(a) over INOUE in view of KAGEYAMA and ENDO is improper for all the above reasons and withdrawal thereof is respectfully requested.

Applicants submit that dependent claims 2-4, which are at least patentable due to their dependency from claim 1 for the reasons noted above, recite additional features of the invention and are also separately patentable over the prior art of record based on the additionally recited features.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection, and an early indication of the allowance of claims 1-4.

SUMMARY AND CONCLUSION

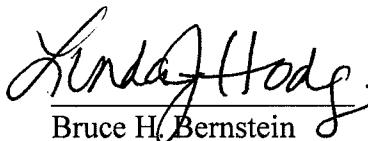
In view of the foregoing, it is submitted that the present response is proper and that none of the references of record, considered alone or in any proper combination thereof, anticipate or render obvious Applicants' invention as recited in claims 1-4. The applied references of record have been discussed and distinguished, while significant claimed features of the present invention have been pointed out.

Accordingly, consideration of the present response, reconsideration of the outstanding Official Action, and allowance of the present response including all of the claims in the application are respectfully requested and now believed to be appropriate.

Applicants have made a sincere effort to place the present application in condition for allowance and believe that they have now done so.

Should there be any questions, the Examiner is invited to contact the undersigned at the below listed number.

Respectfully submitted,
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